May; and exhibitions and foundation scholarships will be awarded to students who show an amount of knowledge equivalent to that which in Classics or Mathematics usually gains an exhibition or scholarship in the College. In short, Natural Science is on the same footing with Classics and Mathematics, both as regards teaching and rewards.

Christ's College.—One or more in value from 30*l.* to 70*l.*, according to the number and merits of the candidates, tenable for three-and-a-half years, and for three years longer by those who reside during that period at the College. The examination will be on April 6. There are other exhibitions which are distributed annually among the most deserving students of the College. Further information may be obtained of John Peile, Esq., Tutor of the College.

Gonville and Caius College.—One of the value of 60*l.* per annum. The examination will be on March 18, in Chemistry and Physics, Zoology with Comparative Anatomy and Physiology, and Botany with Vegetable Anatomy and Physiology. Further information may be obtained from the Tutors. Scholarships of the value of 20*l.* each or more are offered annually for Anatomy and Physiology to members of the College. Gentlemen elected to the Tancred Medical Studentships are required to enter at this College; these studentships are five in number, and the annual value of each is 100*l.* Information respecting these may be obtained from B. J. L. Frere, Esq., 28, Lincoln's Inn Fields, London.

Clare College.—One of the value of 60*l.* per annum, tenable for two years at least. The examination (in Chemistry, Chemical Physics, Zoology with Comparative Anatomy and Physiology, Botany with Vegetable Anatomy and Physiology, and Geology) will be on March 16, and will be open to students intending to begin residence in October.

Downing College.—One or more of the value of 60*l.* per annum. The examination (in Chemistry, Comparative Anatomy, and Physiology) will be on April 6, and will be open to all students not members of the University, as well as to all undergraduates in their first term.

Sidney College.—One of the value of 60*l.* and one of the value of 40*l.* per annum. The examination (in Heat, Electricity, Chemistry, Geology, Zoology and Physiology, and Botany) will be on April 6, and will be open to all students who intend to commence residence in October.

Emmanuel College.—One of the value of 70*l.* The examination, on March 24, will be open to students who have not commenced residence.

St. Peter's College.—One scholarship of the value of from 40*l.* to 80*l.* according to the attainments of the candidate. The examination on April 6 will be in Botany, Chemistry and Chemical Physics, Geology, and Comparative Anatomy and Physiology, but no candidate will be allowed to be examined in more than two of these subjects. Application must be made before March 20 to the Tutor.

Non-Collegiate Students.—An exhibition each year is given by the Clothworkers' Company, value 50*l.* per annum, tenable for three years. Examination about Christmas. Information to be obtained from the Rev. R. B. Somerset, Cambridge.

Although several subjects for examination are in each instance given, this is rather to afford the option of one or more to the candidates than to induce them to present a superficial knowledge of several.

Candidates, especially those who are not members of the University, will, in most instances, be required to show a fair knowledge of Classics and Mathematics, such, for example, as would enable them to pass the Previous Examination.

There is no restriction on the ground of religious denominations in the case of these or any of the scholarships or exhibitions in the Colleges or in the University.

Further information may be obtained from the Tutors of the respective Colleges.

Some of the Colleges do not restrict themselves to the number of scholarships here mentioned, but will give additional scholarships if candidates of superior merit present themselves; and other Colleges than those here mentioned, though they do not offer scholarships, are in the habit of rewarding deserving students of Natural Science.

It may be added that Trinity College will give a fellowship for Natural Science, once at least in three years; and that most of the Colleges are understood to be willing to award fellowships for merit in Natural Science equivalent to that for which they are in the habit of giving them for Classics and Mathematics.

The above list shows that Colleges at Cambridge, like those at Oxford, are by no means backward in offering inducements to the study of Natural Science. The scholarships and exhibitions are open to all persons, whether members of the University or not, provided they are willing to enter and become members of the respective Colleges, with the exception of the 100*l.* scholarships at Trinity College, the candidates for which must have passed the Previous Examination at the University.

NOTES

NEWS has been received from the English Eclipse Expedition dated from Suez: all were well. The *Surat* had been delayed a day by the loss of her screw in the canal, doubtless in that narrow rocky part of the canal some miles above Suez, where so many ships have lost their screws, and the Expedition has proceeded to Galle in the *Baroda*. Arrangements have been made with the Indian Government to have a ship waiting at Galle on the 16th inst. to convey the Camorta party from that place. We publish this week the Instructions to the observers, issued by the Royal Society Committee.

THE Astronomer Royal has communicated the following telegram to the press relating to the Transit of Venus observations at Kerguelen's Land:—"Corbet, Coke, Goodridge observed ingress. Perry good egress. All something. Cloudy. Generally, English photography poor. Americans, Germans lost interior contact. Americans have some photographs."

WE have received a letter, dated Jan. 8, from Mr. C. Meldrum, Mauritius, containing the following additional information regarding the transit observations at the Mauritius:—"The new Observatory is seven miles from Port Louis, and by the time the instrument was received and put in place, we were within a few days of the Transit of Venus. You will have heard (I sent you some newspapers by last mail) that owing to the weather, Lord Lindsay and his party, as well as the German Expedition, could only observe the latter half of the Transit, and that they lost the first external and internal contact. Here at this Observatory I had worse weather, the sky being entirely overcast during the greater part of the time. But it so chanced that the weather clearing up for a short time, and the sun appearing, I got the first internal contact just as the sun was emerging from behind a bank of clouds. We had then a long spell of cloudy rainy weather, with occasional glimpses of the sun. Towards the time of second internal contact the weather again cleared up, and I observed that contact under more favourable circumstances than the first internal. On both occasions I saw a dark band or ligament connecting the limbs of the sun and planet, and noted the times of appearance and disappearance. The first internal contact took place some minutes after the computed time, and the second internal contact a little earlier. Our photo-heliograph arrived after the transit. Both Lord

Lindsay and the Germans are satisfied with what they have got. The morning *before* the transit was beautifully clear and in every respect favourable, but the morning *after* was just the reverse, the sky being entirely overcast. Both expeditions should have been at their post earlier. The English expedition to Rodriguez was successful in regard to weather, which is a lucky incident, for the chances in favour of Mauritius were greater. The fact is that there was an atmospheric disturbance, probably a gale, passing to the N. and N.W. of Mauritius and Bourbon on the 9th, which had passed Rodriguez some days sooner. Lord Lindsay has a slight attack of fever. He leaves soon for India *en route* to England. Davies is going to observe the solar eclipse of the 6th April in Burmah. Dr. Copeland will probably go round the Cape in the *Venus*. Mr. Gill left for Aden to-day with his fifty-two chronometers."

THE fitting of the Arctic ships *Alert* and *Discovery* is making rapid progress at Portsmouth, in the hands of the dockyard shipwrights, who are working extra hours, in order that they may be rigged and out of their hands by the 12th of April. The sledges have all been made, and the tents are in progress. Meanwhile the officers are pursuing their special studies. We understand that Commander Markham, and Lieutenants Archer, Giffard, and Fulford are going through a course of instruction in magnetism. Lieutenants Parr and May are to be initiated into some special astronomical work, and two other lieutenants will receive charge of the pendulum observations. The work connected with spectrum analysis will also be provided for, and one or more of the officers will take up photography. The ships will be commissioned in the middle of April, and will sail early in June.

PROF. ROBERT WILLIS, M.A., F.R.S., Jacksonian Professor of Natural and Experimental Philosophy in the University of Cambridge, died on Sunday night. The late professor graduated at Gonville and Caius College in 1826, coming out ninth wrangler, and was elected a fellow of his College. He was appointed to the above professorship in 1837. He had been President of the British Association, and was member of the Board of Visitors of the Royal Observatory, Greenwich. The professorship vacant by the death of Mr. Willis is worth 300*l.* per annum. The professor is elected by the persons whose names are on the electoral roll of the University.

MR. E. RAY LANKESTER, M.A., Fellow of Exeter College, Oxford, has been elected to the Professorship of Zoology and Comparative Anatomy in University College, London, rendered vacant by the death of Dr. Grant.

MR. J. R. BLAKE, M.A., F.G.S., has been elected to the lectureship on Zoology and Comparative Anatomy at Charing Cross Hospital Medical School.

IN connection with the Loan Exhibition of Scientific Apparatus, meetings have been recently held at the South Kensington Museum, of the sub-committees for the sections of Mechanics, Physics, Chemistry, Geology, and Biology. The limits of the exhibition and various details connected with it were discussed, and recommendations prepared for submission to the General Committee at its next meeting.

IT is announced that the Queen has, on the recommendation of the Prime Minister, granted a pension of 200*l.* a year to Mr. Wood, in recognition of his labours at Ephesus.

THE Queen has been pleased to approve of the following appointments to Companionships of the Order of St. Michael and St. George:—Mr. Augustus Charles Gregory, Surveyor-General of Queensland, who formerly rendered important and valuable services in connection with the exploration at Northern Australia; Mr. Walter Lowry Buller, the well-known ornithologist, author of "The Birds of New Zealand;" and Major Peter Egerton Warburton, of South Australia, who lately conducted important explorations in that colony and Western Australia.

IN his last report of the progress and prospects of the cultivation of various useful trees in India, Dr. King speaks of the caoutchouc-yielding trees and the difficulties attending their cultivation. But his account of the Assam indiarubber tree, *Ficus elastica*, whose large glossy foliage is familiar to almost everybody in this country, excites some surprise. He writes: "The rubber of this country (India) is obtained from fig-trees, most of which (at least in early life) are parasitical [by which he means, of course, *epiphytical*]. These figs begin life by establishing themselves on the tops of other trees, along the trunks of which they send their twining aërial roots, which ultimately reach the ground. In course of time the supporting trees are killed, but the figs remain and grow, often entirely obliterating their predecessors. It is from the long aërial roots that the rubber is mostly got, and not from the branches. After a few severe tappings a fig ceases to yield rubber from its roots. The number of rubber trees, even in a country like Assam, is limited, and it is easy to foresee their early exhaustion. It is true it is also easy to propagate these figs by cuttings, but plants produced from cuttings put into the soil cannot very well have aërial roots, and may consequently be expected to yield little, if any, rubber. The artificial formation of indiarubber plantations on the summits of tall forest trees is obviously impracticable." Now, it has long been known that these indiarubber trees are epiphytical, but it seems far more probable that the mode of growth referred to simply renders it difficult to extract the caoutchouc until the roots come down within reach, not that they represent the principal seat of its secretion. Indeed, if this really be the case, it seems quite inexplicable, for this secretion pervades the whole system. However, it can be only partially true. The aërial roots of *Ficus elastica* are not only produced from the epiphytical examples, but also from those growing in the ground. Mr. Mann and other writers describe them as running along for a distance of thirty or forty feet on the surface of the soil, and mention the fact that the collectors tap the lower parts of the stem and these trailing roots. Looking into Mr. Mann's report on the same subject, he specially mentions the reckless felling of large trees to obtain the caoutchouc more readily; and in reference to the cultivation of the tree in question, he says that planted trees would yield at half the age a naturally grown tree would, as in the latter case several years elapse before an aërial root can reach the ground and establish itself. Dr. King's argument in favour of growing the Pará caoutchouc, *Hevea brasiliensis*, on this ground must fall through; but as the latter is reported to furnish the best quality of caoutchouc, there is a good reason for attempting its cultivation.

DR. KALENDER, of Linderhöhe, near Cologne, gives an elaborate account, in the *Kölnische Zeitung*, of the new enemy to the potato which has caused such ravages in the potato plantations of the United States, namely, the Colorado Beetle (*Doryphora decemlineata*). The general opinion on this beetle is rather uncertain at present, some considering it almost harmless, while others attach great importance to its being prevented from visiting Europe. Dr. Kalender applied to the Prussian Minister for Agriculture, and obtained the most reliable information, which is based upon a report of Mr. C. Riley, in the "Annual Report on the Noxious, Beneficial, and other Insects in the State of Missouri." It appears that the insect passes the winter in the ground, but as soon as the potato plants have developed their first shoots the beetle shows itself. The females then deposit their orange-coloured ova, in lumps of ten to twelve, upon the under surfaces of the leaves; the larvæ appear after five to eight days, and begin their destructive work, which lasts two or three weeks, after which period they trans-

form into nymphæ ; ten to fourteen days later the young beetles appear; thus one summer can see three or four generations, of which the last one passes the winter in the ground. The insect does not confine its devastations to the potato only, but has also been found to attack the young shoots and leaves of *Cirsium lanceolatum*, *Amaranthus retroflexus*, *Lisymbrium officinale*, *Polygonum hydropiper*, *Solanum nigrum*, *Chenopodium hybridum* and *album*, and even of *Hyoscyamus niger*. This variety of plants shows that the insect has great powers of adapting itself to its food, and to this it must be ascribed that it can only with the greatest difficulty be got rid of. The home of the insect was in the Rocky Mountains ; with the westward progress of agriculture the cultivation of the potato approached the birthplace of the insect, and it transferred its dwelling to the potato fields, which of course were welcome food; thus in a short time it became a general plague. In 1859 it began its eastward progress, and has now reached the coast of the Atlantic ; whether it will cross this ocean and begin its devastations in Ireland remains to be seen ; much may, however, be done to prevent its appearance in Europe. The means used for its destruction are various ; the most successful one has been the so-called Schweinfurt green (arseno-acetate of copper). This is mixed with flour and water, and the plants are sprinkled with the mixture. Although highly poisonous to animal life, the Schweinfurt green does not poison the soil, as it is perfectly insoluble in water, and the destruction of the noxious insect is almost complete. Dr. Kalender finally draws the attention of agriculturists to another potato enemy, the *Brystopha solanella*, a minute moth which has made its appearance in Algeria ; its larvæ completely destroy the potatoes themselves, so that they become unfit even for pigs' food. The *Journal de la Société Centrale d'Horticulture en France* warns seriously against the importation of Algerian potatoes.

Don Pedro, Emperor of Brazil, has been elected a corresponding member of the French Academy of Sciences for the section of Geography and Navigation. Don Pedro is the third emperor who has been a member of the Academy. The first was Peter the Great, elected a geographical correspondent. In that capacity he sent a map of the Caspian Sea, which is still kept in the records of the Academy. The second imperial Academician was Napoleon I., who was a member of the section of Mechanics, but resigned after his abdication at Fontainebleau. Napoleon III. tried to get appointed a member, but was not successful.

The Academy of Sciences lost one of its most celebrated home correspondents in the same week as it did Lyell—a foreign correspondent. On the 1st inst., M. Frémy, the President, announced the demise of M. Seguin the elder, at the age of eighty-nine. M. Seguin was educated by his elder brother, and was himself a most daring engineer. He was the contractor of the Lyons and Saint Etienne Railway in 1825, a railway which was worked by horses and ropes for years. He is believed in France to have invented suspension bridges. He maintained at his own expense, during twenty years, the publication of *Cosmos*, a scientific periodical in which he expounded his own ideas on the doctrine of the conservation of force, of which he was a keen and active supporter.

An exploring expedition will shortly leave Marseilles to make researches into the depths and animal organisations of the Mediterranean. Soundings and dredgings similar to those made by the *Challenger* will be made by a steamer specially provided with microscopes, photographic apparatus, and means for preserving new or rare specimens of marine zoology. The expedition is entirely due to private enterprise.

The International Conference on the Metrical System met at Paris on Monday under the presidency of the Duc Decazes, who explained that the object of the Conference was the conclusion of a Convention between States adopting or permitting the use of the metre as the basis of measurement. The Conference has transferred the solution of the questions to be decided to a Commission composed of delegates of the various Governments. M. Dumas, the Permanent Secretary to the Academy of Sciences, has been appointed President of this Commission, Mr. Chisholm being the English delegate.

M. Leverrier has established in the Paris Observatory a registry, where all the scientific facts collected from the several political papers may be cut and labelled. Such a register was kept during the last year of Arago's superintendence, but has been discontinued for years.

On the 23rd of February the Italian Geographical Society discussed the advisability of sending an Italian expedition *viâ* the Red Sea to the sources of the Nile. The members were unanimous in favour of the scheme, and a programme will be issued shortly.

The picturesque city of Caub, in Nassau, near Bacharach, will very shortly, it is said, be crushed and destroyed by the disintegration of the mountain on which Guterfeld Castle was built in mediæval times. The rocks which threaten Caub are not less than 600 feet in height. Two rows of houses have been deserted, as no human power can prevent the catastrophe.

Several continental papers note the fall of ponderous rocks caused by the recent frosty weather. Such occurrences as that referred to in our last number as having occurred at Moen are very frequent on the banks of the Seine. *La Nature* publishes a sketch taken at Sainte Adresse, near Havre, illustrating the progressive levelling of these lofty cliffs partly by the action of the waves, and partly by weathering.

On Feb 18 Dr. Gerhard Rohlfs delivered a lecture at Cologne on the last part of his journey from Tripoli to the coast of Guinea, which is of particular scientific interest. He treated in detail the state of civilisation of the Empire of Bornu (situated near Lake Tsad) and its capital, Kuka, and it appears that the negro tribes that inhabit those parts are highly civilised, in fact much more so than most other tribes in Northern Africa. From Kuka Dr. Rohlfs went to Mandara, which is situated south of Bornu, and then entered the districts of the Pullo (or Fullo) tribes ; he found the inhabitants to be of light yellow, almost white complexion, and surpassing even Europeans with regard to beauty of form and growth. Dr. Rohlfs then descended the Tshadda River, down to where this joins the Niger, and was hospitably received by the English colonists at Lokoja ; from here he visited a negro country in a western direction, then passed the Kong Mountains, and successfully traced his way through the thick tropical forests to the coast, which he reached near Lagos.

The first annual meeting of the Scientific Club was held on Thursday, the 18th inst., Capt. Marshall Hall, F.G.S., in the chair, when a report was presented showing the great progress which has been made since the foundation of the club on the 19th of March last.

The additions to the Zoological Society's Gardens during the past week include two Wild Boars (*Sus scrofa*), European, presented by Mr. Sebastian Anderson ; a Grey Ichneumon (*Herpestes griseus*) from India, presented by Miss R. Barter ; a Common Raccoon (*Procyon lotor*) from North America, presented by Miss Julia Jackson ; a Herring Gull (*Larus argentatus*), European, presented by Miss Jessie Bovill ; two Petz's Conures (*Conurus petzii*) from Peru, presented by Miss Hornby ; two Sarus Cranes (*Grus antigone*) from North India ; a Mandarin Duck (*Aix galericulata*) from China, received in exchange ; three Common Peafowl (*Pavo cristata*) from India, deposited.